Simplex®

4010 Fire Alarm

Service Manual

579-081
Rev. A

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Walk Test™ is protected by US Patent No. 4,725,818.
MAPNET addressable communications is protected by US Patent No.4,796,025.
IDNet™ is patent pending.
TrueAlarm Analog Detection is protected by US Patent No. 5,155,468.
TrueAlarm Detector Base is protected by US Patent No. 5,173, 683.

Cautions and Warnings

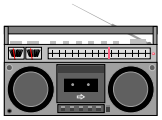
SYSTEM REACCEPTANCE TEST AFTER SOFTWARE CHANGES - To ensure proper system operation, this product must be tested in accordance with NFPA72-1996, Chapter 7 after any programming operation or change in site-specific software. Reacceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring.

All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

READ AND SAVE THESE INSTRUCTIONS. Follow the instructions in the installation, operating and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. Fire Alarm Control Panel (FACP) operation and reliability depend upon proper installation.

DO NOT INSTALL ANY SIMPLEX PRODUCT THAT APPEARS DAMAGED. Upon unpacking your Simplex product, inspect the contents of the carton for shipping damage. If damage is apparent, immediately file a claim with the carrier and notify Simplex.

ELECTRICAL HAZARD - Disconnect electrical power when making any internal adjustments or repairs. Servicing should be performed by qualified Simplex Representatives.



RADIO FREQUENCY ENERGY - This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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Codes and Standards

The 4010 is listed for the following.

UL 864 Listings for Type of System:

- UL 864 Power-Limited Fire Alarm Control Unit
- Local (formerly NFPA 72A)
  Requires the sounding of an alarm via listed notification appliance(s)
- Auxiliary (formerly NFPA 72B)
  Requires 4010-9809 City Circuit Module
- Remote Station - protected premise (formerly NFPA 72C)
  Requires 4010-9809 City Circuit Module or the 4010-9810 or -9816 DACT
- Proprietary - protected premise (formerly NFPA 72D)
  Requires 4010-9817 (with 4010-9818 or 4010-9819) or 4010-9821 Network Interface Modules
- Central Station - protected premise (formerly NFPA 71)
  Requires 4010-9810 or -9816 DACT
- Suppression Releasing Service
  Requires 4010-9814 Suppression Kit

UL 864 Listings for Type of Service:

- Automatic, Manual, Waterflow, and Sprinkler Supervisory

UL 864 Listings for Type of Signaling:

- Coded, Non-Coded, March-Time and DACT
  DACT requires the 4010-9810 or -9816

Factory Mutual Approved

- Same as UL above

Local Approvals

- CSFM
- MEA

Continued on next page

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Codes and Standards (*continued*)

The installer should be familiar with the relevant codes listed below as well as any other applicable local codes and standards, when installing a fire alarm system.

- NFPA 72 National Fire Alarm Code
- NFPA 11 Standard for Low-Expansion Foam and Combined Agent Systems
- NFPA 11A Standard for Medium- and High-Expansion Foam Systems
- NFPA 12 Standard on Carbon Dioxide Extinguishing Systems
- NFPA 12A Standard on Halon 1301 Fire Extinguishing Systems
- NFPA 13 Standard for the Installation of Sprinkler Systems
- NFPA 14 Standard for the Installation of Standpipe and Hose Systems
- NFPA 15 Standard for Water Spray Fixed Systems for Fire Protection
- NFPA 16 Standard for the Installation of Deluge Foam-Water Sprinkler and Foam-Water Spray Systems
- NFPA 16A Standard for the Installation of Closed-Head Foam-Water Sprinkler Systems
- NFPA 17 Standard for Dry Chemical Extinguishing Systems
- NFPA 17A Standard for Wet Chemical Extinguishing Systems
- NFPA 25 Standard for Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems
- NFPA 70 National Electrical Code
- NFPA 80 Standard for Fire Doors and Fire Windows
- NFPA 90A Standard for the Installation of Air Conditioning and Ventilation Systems
- NFPA 90B Standard for the Installation of Warm Air Heating and Air Conditioning Systems
- NFPA 92A Recommended Practice for Smoke-Control Systems
- NFPA 92B Guide for Smoke Management Systems in Malls, Atria, and Large Areas
- NFPA 101 Life Safety Code
- NFPA 170 Standard for Fire Safety Symbols
- NFPA 231C Standard for Rack Storage of Materials
- NFPA 1221 Standard on the Installation, Maintenance, and Use of Public Fire Service Communication Systems

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Chapter 1
Power Up Flowcharts

Introduction

This chapter contains two flowcharts, one containing the 4010's power up sequence and one that can be used to troubleshoot AC power problems.

Be aware of the following when using these flowcharts.

- **The power up sequence occurs quickly.** On a properly functioning system, some phases of the power up sequence (for example, the span of time during which the boot software revision is displayed) appear on the Liquid Crystal Display (LCD) for only a few seconds. It may be necessary to run the power up sequence several times, as you read the flow chart, to properly interpret what is happening.

- **You can skip these flowcharts** if your system has powered up correctly and is displaying a trouble message on the LCD. Refer to Chapter 2 for descriptions of the 4010's trouble messages.

In this Chapter

This chapter discusses the following topics:

Topic	See Page #
Initial Power Up Flowchart	1-2
AC Power Flowchart	1-4

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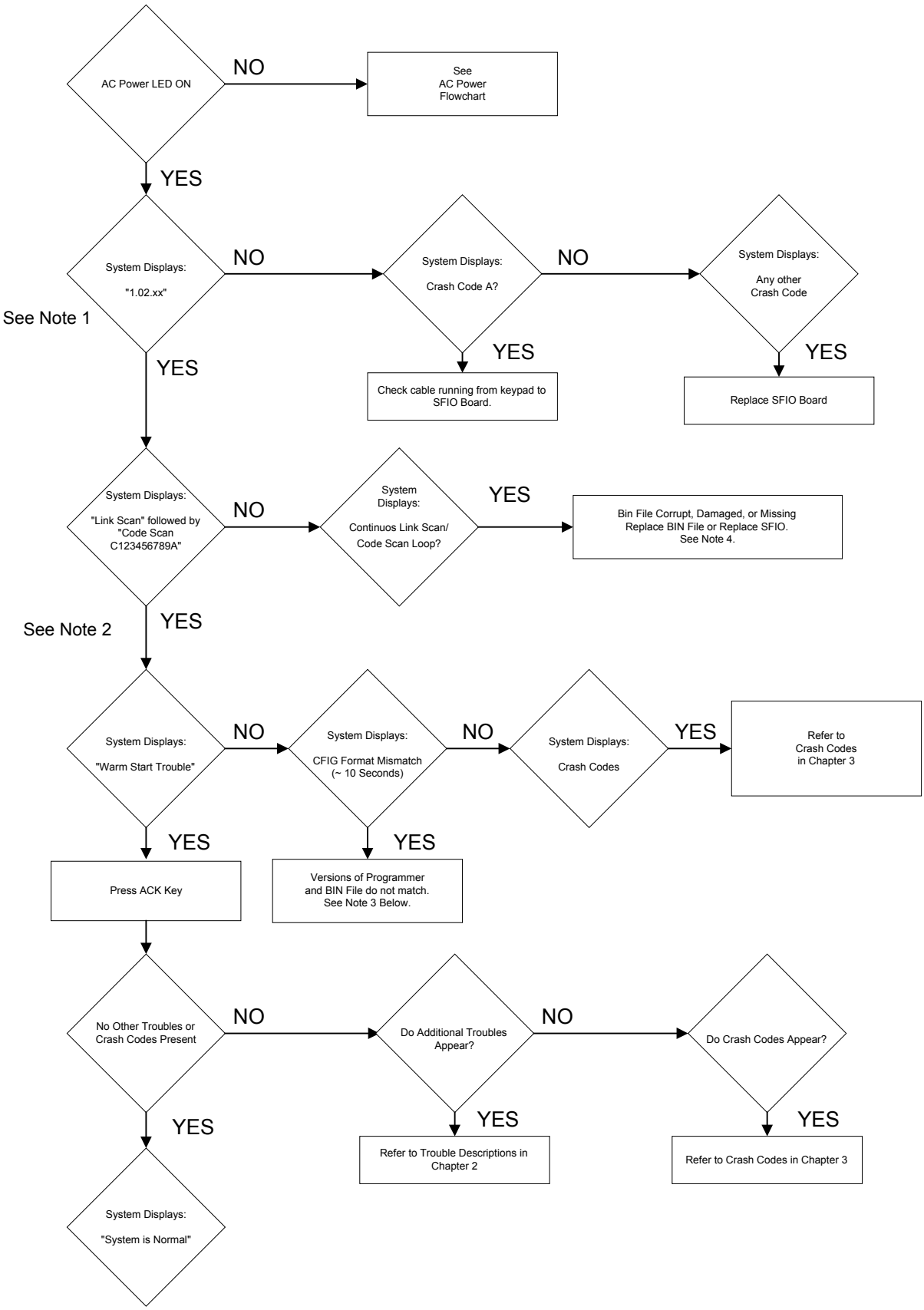
Initial Power Up Flow Chart



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Initial Power Up Flow Chart, *Continued*

Note 1: When the system displays "1.02.xx", this indicates the revision level of the boot software and **does not** indicate the revision level of the panel's BIN file. Refer to "Determining the BIN File Software Revision," in Appendix C of this manual for additional information.

Note 2: Revision 1 systems containing greater than 175 TrueAlarm isolator devices may reboot at this point. If this occurs, upgrade the BIN file and programmer software to Rev. 2. Refer to Appendix A.

Note 3: Keep the following in mind about mismatched CFIG and BIN files:

- If a Rev. 2 job (CFIG) is downloaded to an SFIO board containing a Rev. 1 BIN file, the system reverts to a Rev. 1 factory default job.
- If a Rev. 1 job (CFIG) is downloaded to an SFIO board containing a Rev. 2 BIN file, the system reverts to a Rev. 2 factory default job.

Note 4: The SFIO board must be factory adjusted, tested, and loaded with the latest version of BIN file prior to shipment. If a **new** SFIO board is received in the field and there is no BIN file loaded on it (i.e., a system with a new SFIO enters a continuous link scan/code scan loop), this indicates that the board has not been factory adjusted and tested. Order a new SFIO board, call Service Support to report the problem, and refer to Appendix B of this manual for information on brownout potentiometer adjustment.

Note 5: The BIN file is available on the FTP site, the Technical Services Intranet site, or by ordering Simplex Part # 741-108.

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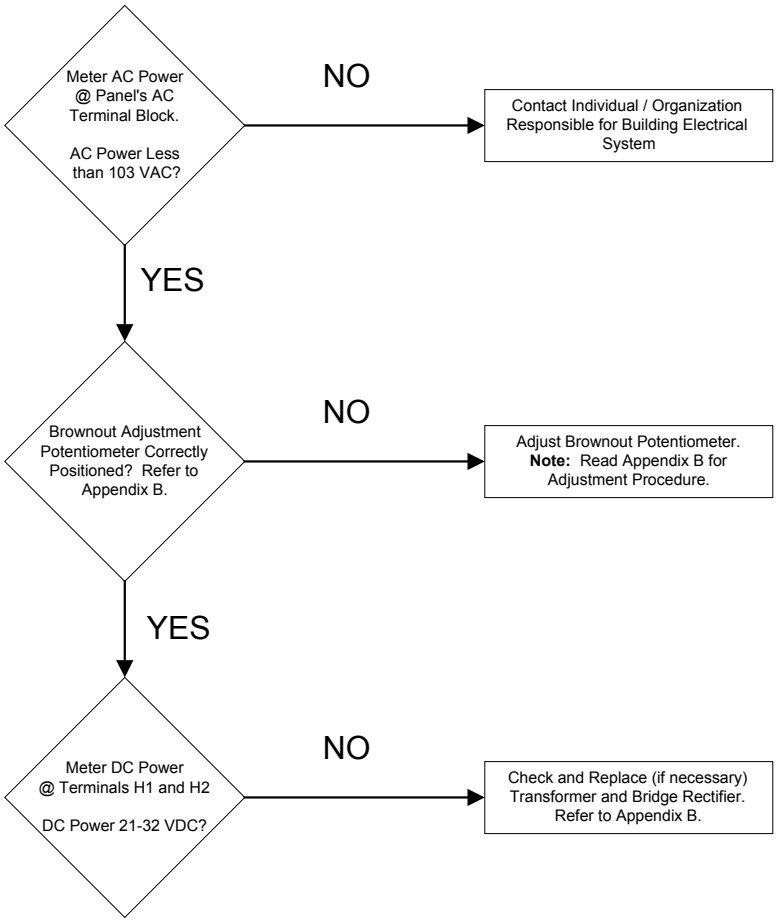
AC Power Flowchart


Meter AC Power @ Panel's AC Terminal Block.
AC Power Less than 103 VAC?
NO
Contact Individual / Organization Responsible for Building Electrical System
YES
Brownout Adjustment Potentiometer Correctly Positioned? Refer to Appendix B.
NO
Adjust Brownout Potentiometer. Note: Read Appendix B for Adjustment Procedure.
YES
Meter DC Power @ Terminals H1 and H2
DC Power 21-32 VDC?
NO
Check and Replace (if necessary) Transformer and Bridge Rectifier. Refer to Appendix B.

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Chapter 2
Interpreting Trouble Messages

Introduction

Trouble messages are the primary means by which the system indicates that a problem has occurred.

This chapter organizes trouble messages by major system components. For example, the section on IDNet troubles contains trouble messages related to IDNet points, as well as trouble messages for the IDNet channel itself.

In this Chapter

This chapter discusses the following topics:

Topic	See Page #
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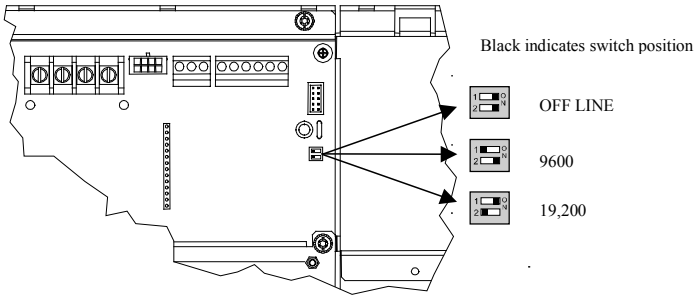
NAC Troubles

Table 2-1. NAC Card and Point Troubles

Type	Trouble Message	Possible Causes / Troubleshooting
NAC Point Troubles	NAC Circuit: SIG1 NAC Circuit: SIG2 NAC Circuit: SIG3 NAC Circuit: SIG4	Remove the field wiring from the NAC. Connect a 10K EOL resistor to the NAC terminal on the panel and see if the trouble clears. Do one of the following depending on whether the trouble clears. • If the trouble does not clear, replace the SFIO board. • If the trouble clears, there is a short or open somewhere on the field wiring running between the NAC terminals on the SFIO and the notification appliances.
	AUX Circuit: AUX1	NAC Card Relay 1 status and configuration.
	AUX Circuit: AUX2	NAC Card Relay 2 status and configuration.
NAC Card Troubles	Missing Card	Check the baud rate set on the SFIO. This trouble indicates that the baud rate may be set to some value other than 9600, which is required for normal operation. Set the baud rate to 9600, as shown below. 
	Wrong Card	This trouble indicates that the NAC card returned a card type as something other than a NAC card type. Indicates either: • Another slave card (LCD Annunciator, 24 Point I/O, RS-232, DACT, or 4120 Network) has a card address of 1. • The SFIO board is bad.
	NACs 1 & 2 Class A or NACs 3 & 4 Class A	Check the following: • Verify that a Class A adapter card is actually installed. This error occurs if the NAC's device type is Class A and the adapter card is not installed. • Power down the panel, remove the Class A card and reseat it in the header on the NAC. Check to see that the pins of the Class A card are properly seated in the header on the NAC card and power on the panel. If the trouble does not clear, power down the panel again and swap another Class A card in place of the suspect card. If the problem still occurs, replace the SFIO board. • Check the field wiring for opens and shorts.

Continued on next page

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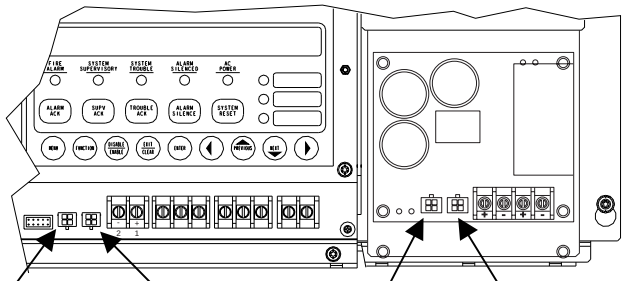
NAC Troubles, *Continued*

Table 2-1. NAC Card and Point Troubles (*continued*)

Type	Trouble Message	Possible Causes / Troubleshooting
NAC Card Troubles	NAC 1 Signal Power NAC 2 Signal Power NAC 3 Signal Power NAC 4 Signal Power	Indicates a power trouble on the NAC. Check the following: • Check the load on the NAC in question while it is in the alarm state. **The load on each NAC must not exceed 2A**. The SFIO board has overcurrent protection for each NAC. An overloaded NAC trips this protection and displays a NAC Signal Power Trouble for the circuit. Unless the circuit is grossly overloaded, you should have several seconds to measure the voltage before the protection trips. Measure the current in either one of the following ways: - **Current Draw for a Single NAC.** Use a DC ammeter, connected in series with the load, to measure the load. - **Current Draw for all NACs.** Measure the voltage across R150, which is located above the LCD on the left-hand side of the SFIO. Divide the measured voltage by .025. The result is the sum of all NAC and auxiliary power loads. • If the problem is with NAC 3 or 4, and they are powered by the 4010's Expansion Power Supply (EPS), check the following: - Verify that the red shunt has been removed from connector P13 on the SFIO board. - Verify that the red (power) harness is connected to P1 on the EPS and P13 on the SFIO board. Verify the white harness (communication) is connected to P14 on the SFIO and P2 on the EPS. - Remove the harness and visually inspect each female pin on both harness connectors. Make sure that none of the pins is pushed back into the connector. *Gently* tug on each wire at the back of the connector. If a wire pulls out from the connector, re-insert it until the pin clicks back into place. Meter each wire for continuity. - **Verify that no circuit draws more than 2A.**  P13 (Red Harness) P14 (White Harness) P1 (Red Harness) P2 (White Harness)

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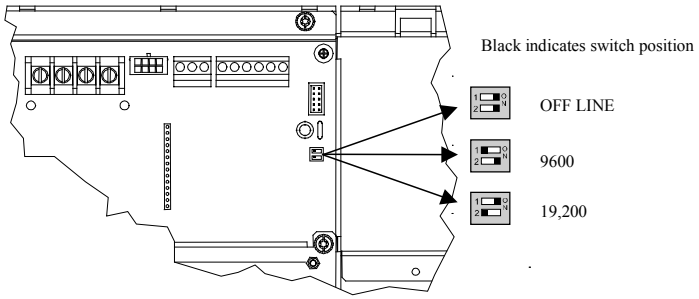
Power Supply Troubles

Table 2-2. Power Supply Troubles

Type	Trouble Message	Possible Causes / Troubleshooting
Power Supply Card	Missing Card	Indicates that the Power Supply card is not communicating with the master. • Check the baud rate set on the SFIO. This trouble may indicate that the baud rate is set to some value other than 9600, which is required for normal operation. Set the baud rate to 9600, as shown below. 
	Wrong Card	Indicates that the Power Supply card returned a card type as something other than a Power Supply Card type. Indicates either: • Another slave card (LCD Annunciator, 24 Point I/O, RS-232, DACT, or 4120 Network) has a card address of 2. • The SFIO board is bad.
Power Supply Points	AC Power	Indicates AC line voltage is too low for proper system operation. Use a meter to verify that the AC circuit is supplying power to the panel. This circuit's voltage must be 120 VAC +10% / -15%. If the circuit supplying power to the panel has sufficient voltage, check the adjustment of the AC Voltage Brownout Potentiometer. See Appendix B of this document.
	Expansion Power Supply	Indicates an Expansion Power Supply (EPS) problem. Try the following: • Verify that the AC circuit to which the power supply connects is supplying 120 VAC (+ 10% / - 15%). - If voltage is present, suspect the EPS transformer, the EPS bridge rectifier, the connectors, or the harness running from the EPS to the SFIO. Refer to Appendix B for information on troubleshooting these components of the EPS. - If no voltage is present, check the AC circuit feeding the panel. • Verify that the black battery wire on the EPS connects to the **– Batt** terminal on the 4010. Even if you are not using battery backup for the EPS, you must connect the black wire to the – Batt terminal.

Continued on next page

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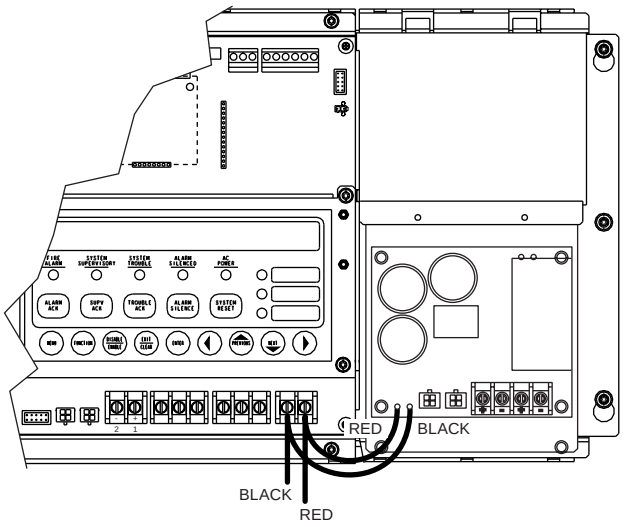
Power Supply Troubles, *Continued*

Table 2-2. Power Supply Troubles (*continued*)

Type	Trouble Message	Possible Causes / Troubleshooting
Power Supply Points	Positive Earth Ground (Fault condition between +24 V and Earth) Negative Earth Ground (Fault condition between 0V and Earth)	Run the Earth Fault search diagnostic. If the results of the Earth Fault search do not isolate the source of the fault, try the following: • Disable each NAC one at a time, checking each time to see if the fault clears. • Disconnect the AUX power from the panel. Check to see if the fault clears. • Disconnect the N2 communications from the panel. Check to see if the fault clears. If the fault is intermittent, use the Earth Fault Latch, located in the Function menu, to silence the fault until the intermittent problem can be isolated and fixed. Note: After fixing the problem, you will need to perform a system reset to clear the Earth Fault Latch. If a negative ground is isolated to the dual RS-232 card and one port of this card attaches to a DC-powered printer and the other port connects to an AC-powered CRT, upgrade 565-810 to Revision A1 or greater. You can also remove jumpers P17 and P18 from this card, if ground detection is not required.
Power Supply Points	Expansion Power Supply Battery	Check the connection of the wires running from the battery to the expansion power supply, as shown in the illustration below. 

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Power Supply Troubles, *Continued*

Table 2-2. Power Supply Troubles (*continued*)

Type	Trouble Message	Possible Causes / Troubleshooting
Power Supply Points	Battery Low	Indicates the battery voltage is low (less than 22.8 V), battery standby is running low, and ***action is required***. Note that this may or may not indicate a problem. Do the following: • Note the time of the Battery Low event and determine if the battery has charged since the event occurred. If the battery is charging, allow it to charge for a full 48 hours and then check the voltage of each battery separately. • If this event occurs without an AC Power fail (check the panel's history log for AC power failure events), suspect either bad batteries (i.e., won't hold a charge) or a battery charger problem. See the battery charger troubleshooting in the "Battery Depleted/Disconnected" trouble.
	Battery Depleted/Disconnected	Indicates the battery has a voltage less than 19.5 V. Do the following: • Check the voltage at the battery terminal block on the SFIO board. The voltage should be 27.6 VDC (+/- 200 mV). If voltage is present, but less than 27.6 VDC, use R256 to adjust the charger voltage. See "Battery Charger Trouble" description later in this section. • Check the fuse and replace if necessary. • Check the voltage of each battery **separately** from the other battery. If one battery is good and the other is bad, replace both batteries. (Note: Batteries are **always** replaced as a set.)
	Battery Low Cutout	This trouble only occurs if the Depleted Battery system option is enabled. Indicates the battery has reached a depleted state, and the system will function in one of two ways: • Shut the system down. This is the ULC-required operation for Canada. Depleted Battery system option requires a special wiring harness to function in this way. • When an alarm occurs, the system does not energize the panel's NAC circuits. This functionality occurs when the Depleted Battery option is enabled, but the special harness is not used.

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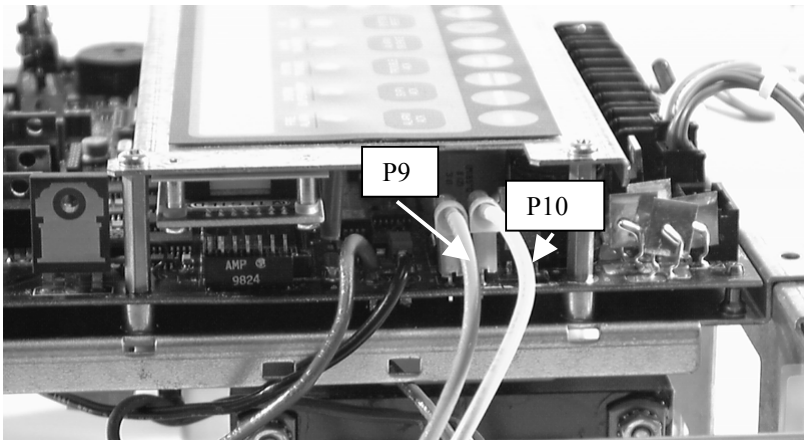
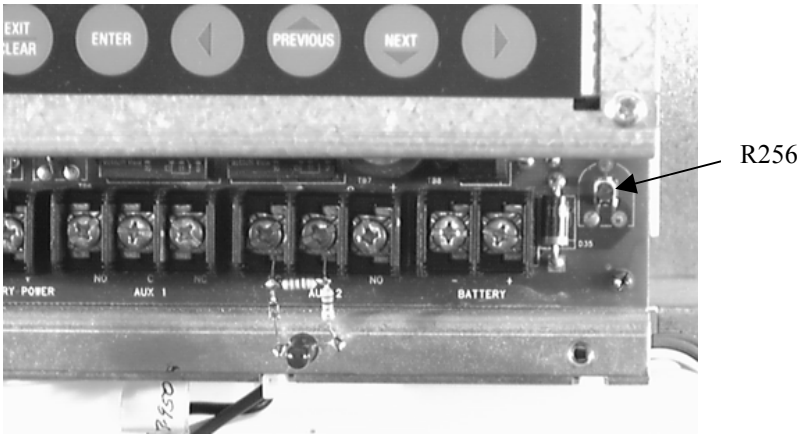
Table 2-2. Power Supply Troubles (*continued*)

Type	Trouble Message	Possible Causes / Troubleshooting
Power Supply Points	Battery Charger Trouble	Indicates a problem with the battery charger circuit. Check the voltage across P9 and P10 and take action as described below.  • **No Voltage at P9 / P10**. Check the voltage across P9 and P10, as shown above. If no voltage is present, check the AC circuit supplying power to the 4010. If the circuit has power, the problem is probably with the AC power supply line voltage transformer. Refer to "Checking the AC Power Supply Transformer / Bridge Rectifier" in Appendix B for information on checking and replacing the line voltage transformer. • **Voltage at Batt + and Batt - Terminals Less than 27.6 VDC.** 1. Disconnect Battery. 2. Adjust Potentiometer R256. Turn the potentiometer a small amount at a time and then recheck the voltage. Adjust the potentiometer until the voltage across these terminals is 27.6 VDC. 3. Reconnect the batteries. At this point, you should expect that the voltage across these terminals is **not** 27.6, as the batteries may be charging. Do not readjust R256 if this is the case. 

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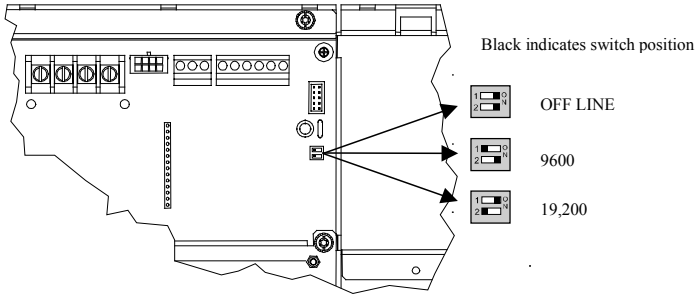
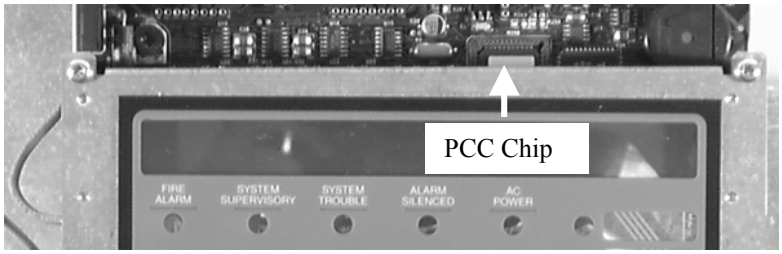
IDNet Troubles

Table 2-3. IDNet Troubles

Type	Trouble Message	Possible Causes / Troubleshooting
IDNet Card	Missing Card	This trouble indicates that the IDNet card is not communicating with the master. • Check the baud rate set on the SFIO. This trouble may indicate that the baud rate is set to some value other than 9600, which is required for normal operation. Set the baud rate to 9600, as shown below.  • If, when adding a 4009 IDNet NAC extender, this trouble occurs and then clears about every 10 to 20 seconds, you need to upgrade the 742-147 / U25 chip on the SFIO board. The revision of this chip required to support the 4009 is Rev 2.x.
	Channel Failure	This trouble indicates a channel failure on the IDNet line. Try replacing the 742-146 PCC chip to see if the problem clears. 1. Remove the four torx screws that secure the LCD to the SFIO board. Carefully lift the LCD from the SFIO board. 2. Use a PLCC chip puller (553-763) to remove the PCC chip. Carefully insert the new PCC chip in the socket and reassemble the LCD.  **Important Note**: If your installation uses isolator bases, this trouble can occur in conjunction with IDNet device troubles. If this is the case, ignore this trouble until all other troubles are cleared. If it is still present, suspect the PCC chip or the SFIO board.

Continued on next page

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IDNet Troubles, *Continued*

Table 2-3. IDNet Troubles (*continued*)

Type	Trouble Message	Possible Causes / Troubleshooting
IDNet Card	Wrong Card	Indicates either: • Another slave card (LCD Annunciator, 24 Point I/O, RS-232, DACT, or 4120 Network) has a card address of 3. • The SFIO board is bad.
IDNet Point	IDNet Device: *Custom_Label*	Indicates a problem with the point associated with the *Custom_Label*. Specific troubles include: **Troubles for All Devices** • No Answer. The problem is most likely with the field wiring, the device itself, or (if connected to one) the ZAM to which the device is connected. - Remove the suspect device from the field wiring and connect it directly to the IDNet channel at the panel. Use Quick CFIG to auto-detect the device. If the panel recognizes the device, the problem is with the field wiring. Check the field wiring for shorts, opens, and grounds. - If the suspect device is an IAM, check the device's wiring. A damaged IAM, which most commonly results from backward wiring, does not communicate with the IDNet channel. Replace the IAM. - Make sure that the suspect device **is not** a MAPNET II ZAM, IAM, and/or pull stations. These devices **are not** compatible with the 4010. Only IDNet-compatible devices can be used. - If an isolator base is installed and programmed as a regular base, IDNet voltage will not pass through the base. • Wrong Device. Indicates that the device is programmed with an incorrect hardware device type. For example, if you program a Quick Connect Photo device with the device type of PHOTO instead of QPHOTO, this trouble occurs. This same scenario also causes a Bad Answer trouble. • Duplicate Device. Two or more devices are set to the same address. The LED on each duplicate device turns ON, allowing you to locate the problem device(s). Readdress the device(s), ensuring that each device has a unique address. • Manual Disable. Indicates that the device has been manually disabled from the front panel. • Bad Answer. Indicates that the device is programmed with an incorrect hardware device type. For example, if you program a Quick Connect Photo device with the device type of PHOTO instead of QPHOTO, this trouble occurs. This same scenario also causes a Wrong Device trouble.

Continued on next page

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IDNet Troubles, *Continued*

Table 2-3. IDNet Troubles (*continued*)

Type	Trouble Message	Possible Causes / Troubleshooting
IDNet Point	IDNet Device: *Custom_Label*	**Troubles for ZAMs / Pull Stations / Monitor IAMs** • Open. Check the field wiring. • Short. Check the field wiring. **Troubles for RIAMs** • Manual Override. • Output Abnormal. Indicates a bad relay on the RIAM. Replace or swap a known working device in place of the RIAM and see if the problem clears. **Troubles for TrueAlarm Devices** • Almost Dirty. Change or clean device. • Dirty. Change or clean device. • Excessively Dirty. Change or clean device. • Output Abnormal (only for devices with sounder/relays). Check 24 VDC power into base. • Head Missing. Normally indicates the TrueAlarm sensor has been removed from the sensor base. In some cases, the TrueAlarm sensor head may be defective.
	Extra Device	This trouble indicates that there is a device answering that is not included in the configuration. Extra devices can be caused by: - Installation of more devices than required for the installation. - Device not programmed. Open the trouble log to identify the address(es) of the extra devices. If this trouble occurs in conjunction with a No Answer Trouble, the problem is most likely a misaddressed device. Fix the address and warmstart the panel to clear the trouble.
	Class A Status	This trouble indicates a Class A trouble condition on the IDNet line. Check the following: • Is there an open on the IDNet wire? • Is the circuit wired for Class B, not Class A, but there is no jumper installed. • The installation includes isolator bases and there is an output abnormal trouble on the isolator point.
	Power Supply Status	This point indicates a power supply trouble on the IDNet card. Replace the SFIO board.
	Ground Fault Status	This trouble indicates that there is a ground fault in the IDNet line. Check the field wiring.
	Short Status	This trouble point indicates a short condition on the IDNet card. Check the field wiring.

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RS-232 / Modem Troubles

Table 2-4. RS 232/Modem Troubles

Trouble Message	Possible Causes / Troubleshooting
Missing Card	Indicates that the RS-232 / Modem card is not communicating with the master. • Ensure that no other N2 cards (LCD Annunciator, 24 Point I/O, RS-232, DACT, or 4120 Network) have a card address of 4. If the RS-232 Card is addressed as card 4, replace the SFIO card. • Check the (733-953) N2 harness. Make sure that all wires are attached to the correct terminals and all connectors are secure. • In some cases, it may take up to one hour for the RS-232 card to come on-line. Contact Service Support for details on a resolution to this problem.
Wrong Card	Indicates that the RS-232 / Modem card returned a card type as something other than a RS-232 / Modem card. • Ensure that no other N2 cards (LCD Annunciator, 24 Point I/O, RS-232, DACT, or 4120 Network) have a card address of 4. If the RS-232 / Modem card is addressed as Card 4, replace the SFIO card.
Port A Disconnected Port B Disconnected	Check the following: • Is the power to the attached device turned off? If so, turn it on and see if the trouble clears. • Is the correct cable being used to attach the device to the serial port? • Is the device connected? If the port is supervised, and you disconnect the device after using it, this trouble occurs. • If the device is a printer, is it out of paper?

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SDACT Troubles

Table 2-5. SDACT Troubles

Trouble Message	Possible Causes / Troubleshooting
Missing Card	Indicates that the SDACT card is not communicating with the master. • Check the position of switch SW2 on the SDACT card. This switch must be in the normal position. • Ensure that no other N2 cards (LCD Annunciator, 24 Point I/O, RS-232, DACT, or 4120 Network) have a card address of 8. If the SDACT Card is addressed as card 8, replace the SFIO card. • Check the N2 harness (733-953). Make sure that all wires are attached to the correct terminals and all connectors are secure.
Wrong Card	Indicates that the card at address 8 is some type other than an SDACT card. Ensure that no other N2 cards (LCD Annunciator, 24 Point I/O, RS-232, DACT, or 4120 Network) have a card address of 8. If the SDACT Card is addressed as Card 8, replace the SFIO card.
Central Station	This trouble indicates that the SDACT attempted to dial the central station and communication was lost. Contact the central station to determine whether the problem is on the customer or central station end.
Phone Line 1 Phone Line 2	This trouble indicates that the phone line has been disconnected. Swap a known working card in place of the SDACT and see if the problem corrects itself. Check the line's physical connections; contact the phone company for additional troubleshooting help.
Program Checksum	This trouble indicates that the on board SDACT card checksum test has failed. Use the SDACT programmer to reload the SDACT database. The database is either corrupt or was never loaded.
DB Version Mismatch	This trouble indicates that the configuration loaded on the SDACT card differs from the configuration on the master. Make changes to the 4010, build and download the 4010, then merge the new .PTF file in the SDACT programmer and download the SDACT card.

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Network Troubles

Table 2-6. Network Troubles

Trouble Message	Possible Causes / Troubleshooting
Missing Card	Indicates that the network card is not communicating with the master. • Ensure that no other N2 cards (LCD Annunciator, 24 Point I/O, RS-232, SDACT, or 4120 Network) have a card address of 8. If the network card is addressed as card 8, replace the SFIO card. • Check the N2 harness. Make sure that all wires are attached to the correct terminals and all connectors are secure. • If the network card is reported as missing during a system reset, upgrade the 4010 BIN file and programmer to Rev. 2.
Wrong Card	Indicates that the card at address 8 is some type other than a network card. • Ensure that no other N2 cards (LCD Annunciator, 24 Point I/O, RS-232, SDACT, or 4120 Network) have a card address of 8. If the network card is addressed as Card 8, replace the SFIO card.
Version Mismatch	This trouble indicates that the configuration loaded on the network card differs from the configuration on the master. Either changes were made to the database and it was not rebuilt and reloaded, or the wrong job is loaded.
Net Comm Failure	This trouble indicates that communication was lost between the network card and the 4120 network. • Swap another 4120 card in place of the existing card to check whether the 4120 card is the source of the problem. • Check all network field wiring for shorts and opens. • Use the 4100 or GCC diagnostics to troubleshoot; examine the network attendance and topology screens to determine the location of the problem.
Ground Fault	If you are using a fiber optic transmitter/receiver module, examine the network card's supporting bracket to see if the module is touching the bracket. If it is, use a strip of insulating material to isolate the bracket from the fiber optic module. If you are using a fiber optic network card (565-818) and the ground fault is intermittent, check to see if resistor R62 is present. It should be a 10 K resistor. If the resistor is missing, replace the card with version Rev. A1.
Duplicate Node	This trouble indicates that more than one node on the 4120 network is answering for the same address. (Note that this trouble is not presently supported.)
Network Miswire	This trouble indicates that the port-to-port network wiring is incorrect (i.e. left-to-left or right-to-right). Check the network wiring and swap if necessary.

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24 Point I/O Troubles

Table 2-7. 24 Point I/O Troubles

Type	Trouble Message	Possible Causes / Troubleshooting
24 PT I/O Card Troubles	Missing Card	Indicates that the 24 Point I/O card is not communicating with the master. • Ensure that no other N2 cards (LCD Annunciator, RS-232, SDACT, or 4120 Network) have a card address within the range of 9-14. If the 24 point I/O card is addressed within this range, replace the SFIO card. • Check the N2 harness. Make sure that all wires are attached to the correct terminals and all connectors are secure.
	Wrong Card	Indicates that the card within this address range is some type other than a 24 point I/O card. • Ensure that no other N2 cards (LCD Annunciator, 24 Point I/O, RS-232, SDACT, or 4120 Network) have a card address of 8. If the 24 point I/O card is addressed within this range, replace the SFIO card.
24 PT I/O Point Troubles	I/O Card #, Point *X* (where *X* is a point from 1 to 24)	Indicates a trouble on one of the 24 PT I/O card's points. Possible troubles include: • Manual Override. • Manual Disable. • Short. Ensure that the power feeding the LEDs is installed on TB5. • Open. Check field wiring.

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LCD Troubles

Table 2-8. LCD Troubles

Trouble Message	Possible Causes / Troubleshooting
Missing Card	Indicates that the LCD card is not communicating with the master. • Ensure that no other N2 cards (24 Point I/O, RS-232, SDACT, or 4120 Network) have a card address within the range of 9-14. If the LCD card is addressed within this range, replace the SFIO card. • Check the N2 harness. Make sure that all wires are attached to the correct terminals and all connectors are secure.
Wrong Card	Indicates that the card within this address range is some type other than a 24 point I/O card. • Ensure that no other N2 cards (24 Point I/O, RS-232, SDACT, or 4120 Network) have a card address of within the range 9-14. If the LCD is addressed within this range, replace the SFIO card.
LCD Membrane	This trouble indicates that there is a problem with the keypad on the LCD card. Reseat the LCD connectors and see if the problem clears. If the problem does not clear, replace the SFIO board.
LCD Display	This trouble indicates that there is a problem with the display on the LCD card. Reseat the LCD connectors and see if the problem clears. If the problem does not clear, replace the SFIO board.

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4009 IDNet NAC Extender Troubles

The 4009 IDNet NAC Extender Card (4009) has 40 card status points associated with it. Since an actual card does not exist at address 17, the card status points on the 4009 "card" do not actually provide information on the card itself. Instead, the 4009 Card Status points are used to provide information on the 4009 devices configured in the system. The 4010 can have up to five 4009 devices programmed into the system. There are 8 card status points associated with each possible 4009 that can be added to the system (5 devices multiplied by 8 points per device equals 40 points). The following table describes the card status points for the 4009 card.

Table 2-9. 4009 Troubles

Type	Trouble Message	Possible Causes / Troubleshooting
4009 NAC Card Troubles	IDNet Device: M#-# AC Power Fail	This trouble indicates that there is an AC Power failure on the 4009 device. The device is indicated by the IDNet address provided.
	IDNet Device: M#-# Pos Earth Ground	This trouble indicates that there is a Positive Earth ground on the 4009 device. The device is indicated by the IDNet address provided. Remove the field wiring from the device associated with the trouble and see if it clears. Swap another device in place of the device associated with the trouble and see if it clears.
	IDNet Device: M#-# Neg Earth Ground	This trouble indicates that there is a Negative Earth ground on the 4009 device. The device is indicated by the IDNet address provided. Remove the field wiring from the device associated with the trouble and see if it clears. Swap another device in place of the device associated with the trouble and see if it clears.
	IDNet Device: M#-# Missing Option Card	This trouble indicates that the 4009 device has one or more of its configured option cards missing or failed. The device is indicated by the IDNet address provided.
	IDNet Device: M#-# Battery Fault	This trouble indicates that there is a battery failure on the 4009 device. The device is indicated by the IDNet address provided.
	IDNet Device: M#-# NAC Power	This trouble indicates that one or more of the NACs on the first 4009 device has a power failure. The device is indicated by the IDNet address provided.
	IDNet Device: M#-# Missing Class A	This trouble indicates that there is a missing Class A adapter on the first 4009 device. The device is indicated by the IDNet address provided.
	IDNet Device: M#-# IDNet Class A	This trouble indicates that there is a Class A condition on one of the circuits on the 4009 device. The device is indicated by the IDNet address provided. Make sure the Class A adapter is installed. If an adapter is present, swap another adapter in its place and see if the trouble clears.
4009 NAC Point Troubles	IDNet M1-#: *Custom Label*	Indicates a trouble for the 4009 NAC device associated with the IDNet address provided. Possible problems could be: • Manual Override. • Manual Disable. • Open. • Short.

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Digital Pseudo Point Troubles

Table 2-10. Digital Pseudo Point Troubles

Point	Label	Description
D4	Extra N2 Card	Turned on at panel startup if an unprogrammed N2 slave card is detected. Only clears on panel restart.
D5	External N2 Trouble	Turns on when panel is no longer communicating with ALL slave cards. Turns off on a System Reset.
D7	Cold Start	Indicates that panel has performed a cold start. Turns of when acknowledged.
D8	Warm Start / Check Time and Date	Indicates that panel has performed a warm start. Turns off when acknowledged.
D10	System Time and Date	Indicates that the time and date is incorrect. Turns off when time and date is updated.
D11	Simplex Service Mode	Indicates that the panel is in Service Mode. Turns off only on a panel restart.
D13	Active List Overflow	Turns on when the number of alarms, supervisories, or troubles is greater than the system active list size (100 fires, 50 supv, 300 troubles). Turns off on a panel restart.
D14	City Disconnect	On if city circuit is disconnected.
D15	City Circuit Trouble	On if city circuit is in trouble.
D17	Control Point Bypass	On if control points are bypassed.
D18	Elevator Bypass	On if elevator recall points are bypassed.
D19	Doorholder Bypass	On if doorholder points are bypassed.
D20	Verification Tally Limit Exceeded	On when any verified points tally limit exceeds10. Off when all points tally limit is below 10.
D21	Walk Test Active in System	On when Walk Test is active.
D23	TrueTest Active in System	On when TrueTest is active.
D24	Programming Mode - System Disabled	On when Programming or Quick-CFIG is entered. Panel is no longer operational.
D45	Duplicate IDNet Device Detection Active	When on (either through front panel or SMPL) it enables the duplicate device detection diagnostic on the IDNet card.
D47	Event Queue Overflow	On when the RS232/LCD annunciator event queue is overflowed and events have been missed. Panel restart clears the trouble, or you can manually turn D47 OFF. See “Clearing an Event Overflow Trouble” in Appendix C for information on turning off this point.
D48	LCD Annunciator Sounder Disable	When on the panel tells all LCD Annunciators to disable their local sounder. Turning pseudo off will enable the sounders. Controllable from front panel only- not SMPL.

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Chapter 3
Crash Codes

Introduction

This chapter lists the 4010 FACP's "crash codes." A crash code indicates that an unrecoverable error (a crash) has occurred to the software executing on the 4010 FACP.

The exact troubleshooting information that you can gather from a crash depends on whether you are at the panel at the time of the crash.

- **If You Are at the Panel When a Crash Occurs.** Within 45 Seconds of a crash, the LCD clears, the LEDs flash, the piezo sounds, and a crash message displays for 45 seconds. After 45 seconds, the system attempts to reset itself and the crash information is cleared from the display.

  The crash message appears similar to the following. Make sure to record ***all*** information, including program counter, bank number, and task number.

CRASH # xx		
PC = xxxx	BANK # xx	TASK xx

  Crash # xx is a hexadecimal code corresponding to a specific unrecoverable error. Refer to Table 3-1 for a list of these codes and possible corrective actions.

  PC = xxxx is the hexadecimal address of the CPU's program counter.

  BANK # xx is the hexadecimal address of the active memory bank at the time of the crash.

  TASK xx is the active task number (in hexadecimal) at the time of the crash.

- **If You Are Not at the Panel When a Crash Occurs**. The Crash Code and the Task Number (see above for descriptions) are stored in a historical log entry.

In this Chapter

This chapter discusses the following topics:

Topic	See Page #
Summary of Crash Codes	3-2

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Summary of Crash Codes

Table 3-1. Crash Codes

Code	Corrective Action
Crash Code =0D PC = BD76	A pulse statement in Custom Control does not have an analog pseudo point referenced to it. Fix the CC equation.
Crash Code = 0D PC = BA09	This is a known problem with Version 1.02. Upgrade panel to Revision 2.01
0	Code not supported by 4010.
1	Replace SFIO.
2	Code not supported by 4010.
3	Reload application.
4	Reload application.
5	Reload application or replace SFIO.
6	Reload application or replace SFIO.
7	Reload application or replace SFIO.
8	Reload application or replace SFIO.
9	Replace SFIO.
A	Keypad is missing. Check keypad connections / Replace SFIO.
B	Indicates a mismatch between BIN file and programmer software. Upgrade BIN file and programmer software to same revision.
C	Reload job. Check versions of 4010 Programmer and BIN file.
D	Reload job. Check versions of 4010 Programmer and BIN file.
E	Reload job. Check versions of 4010 Programmer and BIN file.
F	Code not supported by 4010.
10	This can be caused by using the PC programmer to assign a point type of unavailable to a NAC or 24 point I/O point. This code can also be caused by selecting an RIAM (relay IAM) device type for an IAM. Make changes and reload job. Check versions of 4010 Programmer and BIN file.
11	May indicate that a not available device type was selected for a signal circuit. Reload job. Check versions of programmer and BIN.
12	Replace SFIO.
13	Replace SFIO.
14	Reload application.
15	Reduce cards/reload job.
16	Reload BIN File.
17	
18	Replace SFIO.
19	
1A	Reload CFIG. Check versions of 4010 Programmer and BIN file.

Continued on next page

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Summary of Crash Codes, *Continued*

Table 3-1. Crash Codes (*continued*)

Code	Corrective Action
1B	Reload CFIG. Check versions of 4010 Programmer and BIN file.
1C	Reload CFIG. Check versions of 4010 Programmer and BIN file.
1D	Reload CFIG. Check versions of 4010 Programmer and BIN file.
1E	
1F	
20	Reload BIN file.
21	Reload BIN file.
22	Reload BIN file.
23	Reload BIN file.
24	Reload BIN file.
25	Reload BIN file.
26	Reload BIN file.
27	Reload BIN file.
28	Reload BIN file.
29	Reload BIN file.
2A	Reload BIN file.
2B	Reload BIN file.
2C	
2D	
2E	
2F	
30	
31	
32	Reload Job / Check versions of 4010 Programmer and BIN file. / reload BIN File
33	Reload Job / Check versions of 4010 Programmer and BIN file. / reload BIN File
34	Reload Job / Check versions of 4010 Programmer and BIN file. / reload BIN File.
35	Reload Job / Check versions of 4010 Programmer and BIN file. / reload BIN File
36	Reload Job / Check versions of 4010 Programmer and BIN file. / reload BIN File
37	Reload Job / Check versions of 4010 Programmer and BIN file. / reload BIN File
38	

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Appendix A
Compatibility Matrix

Introduction

This appendix lists the 4010 FACP's features and indicates whether a specific hardware or software component is required to support a specific feature or set of features.

In this Appendix

This appendix discusses the following topics:

Topic	See Page #
Determining Compatibility between Versions 1 and 2	A-2

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Determining Compatibility between Versions 1 and 2

Introduction

Keep the following in mind when reviewing this table:

- 4010 Phase 1 features are compatible with any mix of SFIO card, SFIO firmware, BIN file, and programmer software (BIN and programmer software must be same revision level).
- The Rev. C SFIO board provides improved overload protection for the U9 voltage regulator.
- QuickAlert functionality for the 4010 SFIO's NACs requires the Rev. C SFIO board, Version 2 SFIO firmware, and Version 2 of the BIN file and programmer application.
- Discrete battery trouble reporting requires the Rev. C SFIO board, Version 2 SFIO firmware, and Version 2 of the BIN file and programmer application.
- 4009 IDNet NAC Extenders require the Rev. B or Rev. C SFIO board, Version 2 SFIO firmware, and Version 2 of the BIN file and programmer application.
- All other 4010 Version 2 features are supported by either version of the SFIO card and SFIO firmware, **but you must have Version 2 of the BIN file and programmer application.**

Table A-1. Compatibility Matrix for Versions 1 and 2

Feature	SFIO Board Rev. B 565-736	SFIO Board Rev. C (565-736)	SFIO FW Version 1 742-147	SFIO FW Version 2 742-147	Programmer and BIN File Version 1 741-108 & 107	Programmer and BIN File Version 2 741-108 & 107
Phase 1 Features	Yes	Yes	Yes	Yes	Yes	Yes
IDNet U9 Overload Protection		Yes				
4010 SFIO QuickAlert NACs		Yes		Yes		Yes
FM Battery Charger TBL		Yes		Yes		Yes
4009 IDNet Interface	Yes	Yes		Yes		Yes
Other Version 2 Features	Yes	Yes	Yes	Yes		Yes

Continued on next page

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Determining Compatibility between Versions 1 and 2, *Continued*

Using the Version 2.x Programmer with Version 1.x Jobs

Using the programmer to edit jobs on a panel containing older versions of the SFIO chip and board has the following effect:

- After saving the job, the panel tags the job as a Phase II job.
- Subsequent editing of the job cannot take advantage of the full set of Phase II features, despite the job's Phase II designation.

Because this situation may become confusing, it is recommended that you upgrade the panel's SFIO card and SFIO firmware before editing its job with the Phase II programmer.

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Appendix B
Power Supply
Adjustment and Troubleshooting

Introduction

This appendix provides basic troubleshooting procedures related to the 4010 FACP's power supply.

In this Appendix

This appendix discusses the following topics:

Topic	See Page #
Adjusting the AC Power Supply Brownout Potentiometer	B-2
Checking AC Power Supply Transformer / Bridge Rectifier	B-3
Checking EPS Transformer / Bridge Rectifier	B-6

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Adjusting the AC Power Supply Brownout Potentiometer

Overview

The AC Power Supply Brownout Potentiometer (R252) is factory adjusted and ***should not require field adjustment.*** The exception to this is when an SFIO board is received in the field without a BIN file downloaded to it. This indicates that the board may not have been factory adjusted and tested. In this case, you should download a BIN file to the SFIO and adjust the brownout. This allows you to use the system until a new SFIO board can be ordered and installed.

Figure B-1 shows the proper position for this potentiometer. The slot on the potentiometer should be positioned such that an imaginary, perpendicular line extends from the middle of the slot to the 1:00 position. In Figure B-1, the dashed line represents this imaginary line.

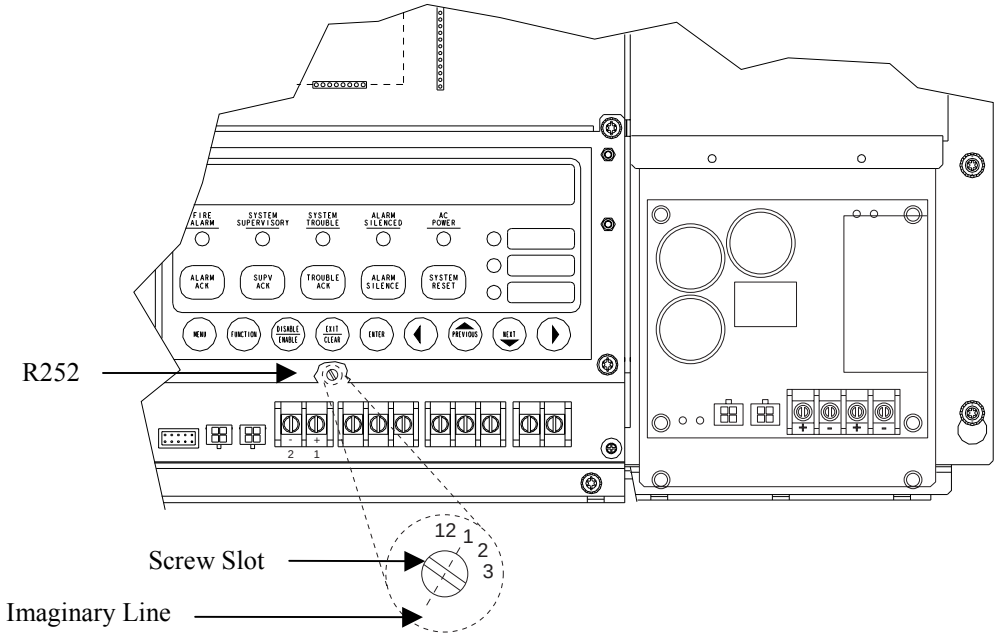

Figure B-1. Correct Position AC Power Supply Brownout Potentiometer

Using a Variac to Adjust the Brownout Potentiometer

The following procedure describes using a variac to adjust the brownout circuit. The brownout potentiometer is R252, which is located just above the AUX PWR terminal strip and just below the Exit/Clear button. Remove the LCD display prior to performing this adjustment.

1. Turn R252 counter-clockwise to its maximum resistance setting.
2. Connect the system to nominal AC line voltage.
3. Adjust the AC input voltage to place the system in brownout.
4. Adjust the AC input voltage to 107.8 – 108 VAC.
5. Adjust R252 until K8 energizes.

As adjusted above, a lightly loaded system (no alarm current – just normal standby) will not transfer to batteries until about 80 VAC. It will return at the same point under load or not load. When returning from brownout, the system may take up to 30 seconds after the voltage has stabilized at 107.8 –108 VAC before switching from batteries to AC line voltage.

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Checking AC Power Supply Transformer / Bridge Rectifier

Checking DC Voltage at H1 and H2

The 4010 line voltage transformer and bridge rectifier convert 120 VAC to the DC voltage required by the 4010.

1. Meter the DC voltage across the crimped base of H1 and H2, just at the point where the wires attach to the PC board. Refer to Figure B-2. These terminals connect to the bridge rectifier mounted on the 4010 chassis, which in turn connects to the line voltage transformer. DC Voltage across these terminals should be within the range of **21-32 VDC**.

2. Interpret the results of this test, as follows:

   - If there is power at H1 and H2, the most likely cause is an incorrectly adjusted brownout potentiometer. Refer to the previous section in this appendix for information on setting this component.

   - If there is no power at H1 and H2, there may be a problem with the line voltage transformer, bridge rectifier, or one of the connectors.

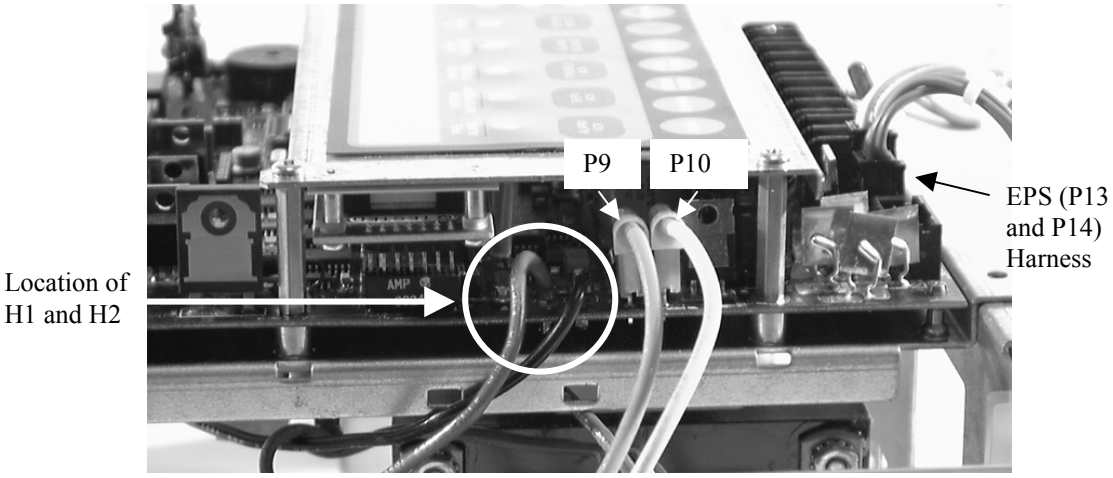

Figure B-2. Location of H1 and H2 and P9 and P10

Checking Connectors

A series of plastic connectors link the 4010 PC board, the line voltage transformer, and the bridge rectifier to the building's AC power circuit. Checking the integrity of these connectors allows you to eliminate these components as a possible cause for AC power problems.

1. **REMOVE ALL POWER (AC and Battery) FROM THE PANEL.**

2. Remove the four Torx screws that secure the panel's electronics to the chassis.

3. Disconnect the External Power Supply harness from connectors P13 and P14 on the 4010 PC board.

Continued on next page

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Checking Connectors
(continued)

4. Disconnect connectors P9 and P10, located on the left side of the panel's PC board. Label the wires to make reattachment easier. See Figure B-2.

5. Lift the panel's electronics from the chassis, and visually inspect the four connectors attached to the bridge rectifier. See Figure B-3. Remove each connector one at a time and check the crimped connection between the connector and the wire. Gently pull on the wires to make sure that they are firmly attached to the connector.

6. Remove and visually inspect the AC power bulkhead connector. This connector mounts to the bottom of the panel chassis, and connects the incoming AC Power wiring to the input wiring of the line voltage transformer. Check the crimped connection between the connector and the wires. Gently pull on the wires to make sure that they are firmly attached to the connector. Refer to Figure B-3 for the location of the bulkhead connector.

7. Reattach all connectors and reapply AC power. If the green LED still does not light, replace the transformer and bridge rectifier. Refer to "Replacing the Line Voltage Transformer and Bridge Rectifier" later in this section for information on doing this.

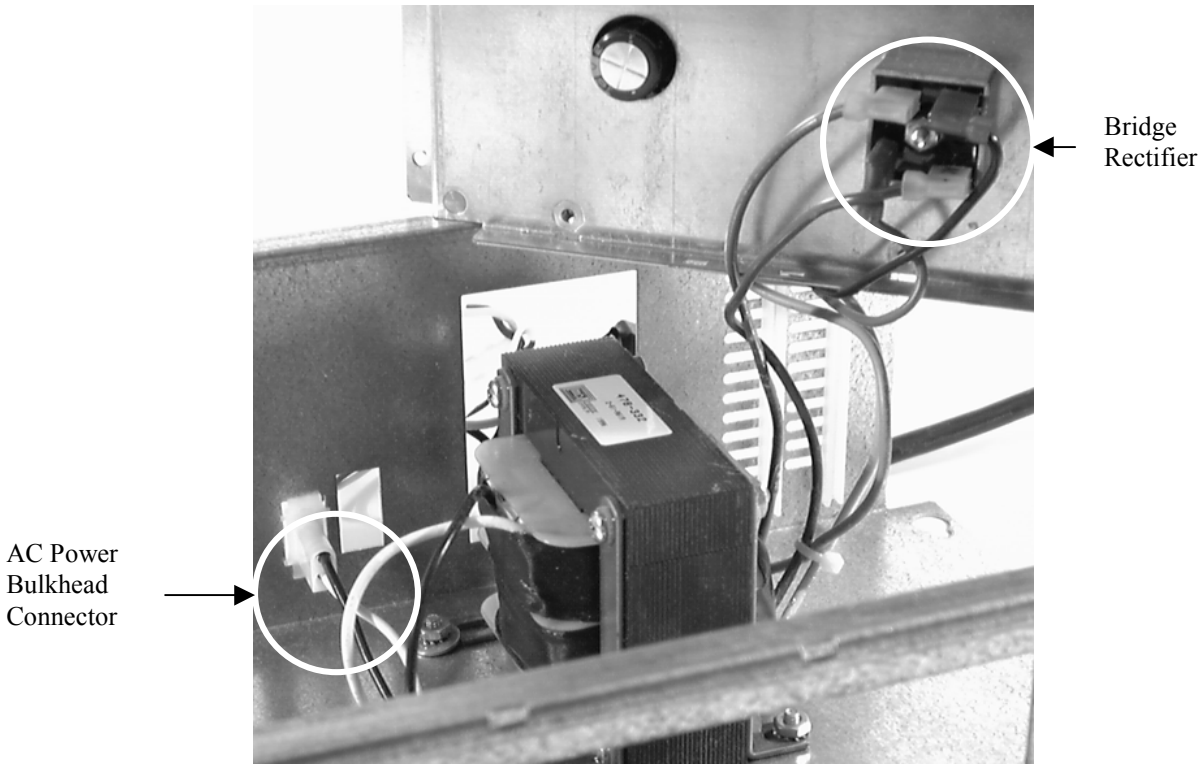

Figure B-3. Visually Inspect the Condition of Terminals

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Replacing the Line Voltage Transformer and Bridge Rectifier

If there is no voltage at H1 and H2 and a visual inspection of the connectors does not reveal any obvious problems, you should replace the line voltage transformer and the bridge rectifier, using the following instructions.

1. **REMOVE AC POWER FROM THE PANEL.**
2. Remove the four Torx screws that secure the panel's electronics to the chassis.
3. Disconnect the External Power Supply harness from connectors P13 and P14 on the 4010 PC board.
4. Disconnect connectors P9 and P10, located on the left side of the panel's PC board. Label the wires to make reattachment easier. See Figure B-3.
5. Lift the panel's electronics from the chassis, and disconnect the four connectors attached to the bridge rectifier.
6. Unbolt the bridge rectifier and transformer from the 4010 chassis and replace.
7. Reattach all wiring as shown in Figure B-4.
8. Reconnect all connectors and reapply AC Power.

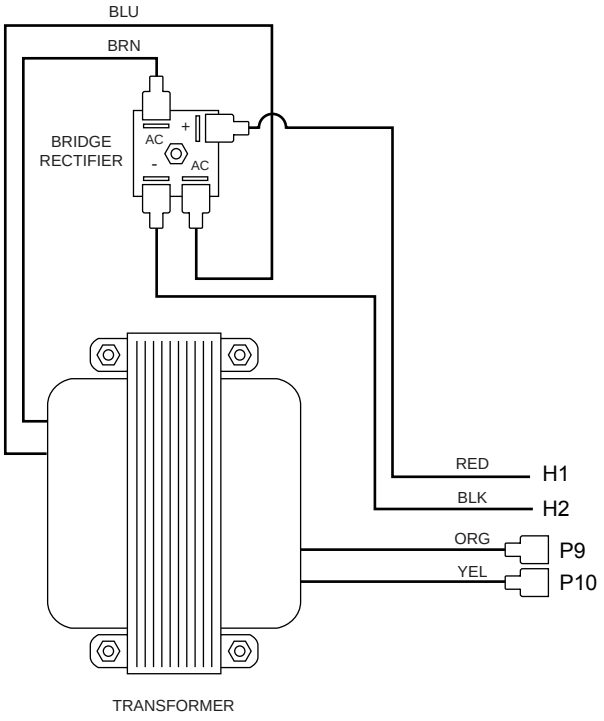

Figure B-4. AC Transformer Bridge Rectifier Wiring

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Checking EPS Transformer / Bridge Rectifier

Introduction

If the initial troubleshooting indicates that the EPS is receiving adequate 120 VAC from the AC circuit, the next step is to verify the integrity of the EPS transformer, bridge rectifier, and their connectors.

Checking DC Voltage from EPS Bridge Rectifer

1. Meter the DC voltage across the terminals marked RED1 and BLK1 on the EPS. Meter the terminals at the crimp, just at the point where the wires attach to the PC board. Refer to Figure B-5. These terminals connect to the bridge rectifier mounted on the rear of the EPS, which in turn connects to the EPS line voltage transformer. DC Voltage across these terminals should be within the range of **21-32 VDC.**

2. If there is no power at RED1 and BLK1, there may be a problem with the EPS line voltage transformer, bridge rectifier, or one of the connectors.

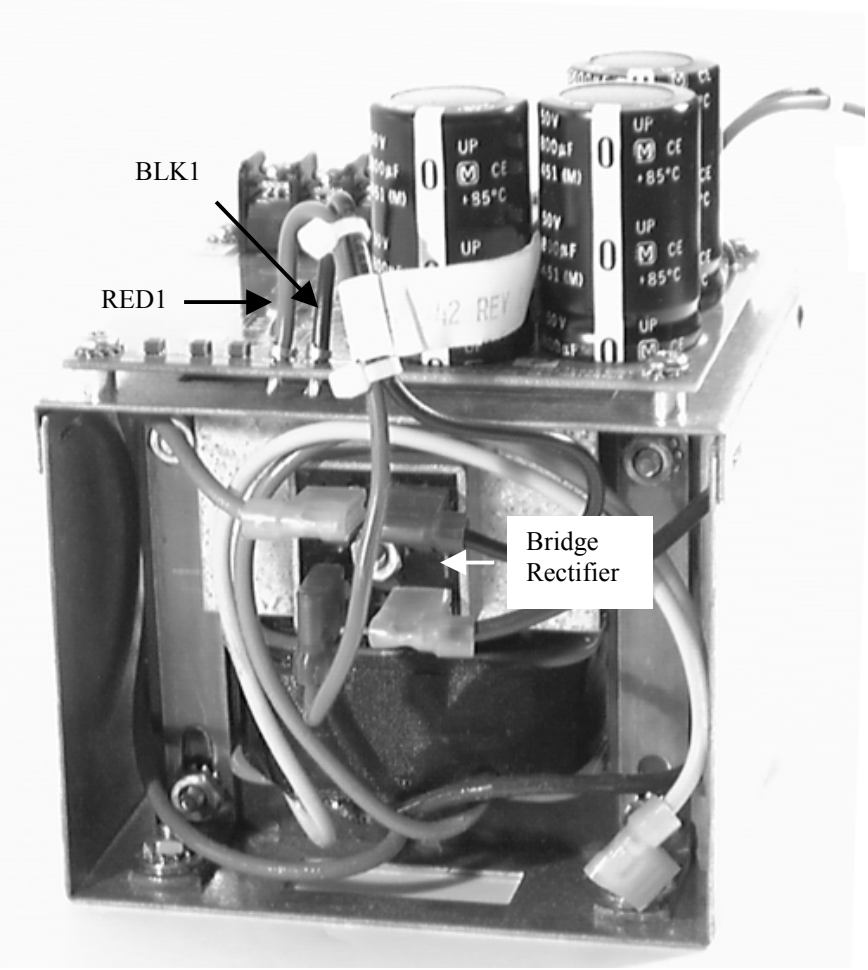

Figure B-5. Location of RED1 and BLK1

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Checking Connectors

A series of plastic connectors link the EPS's line voltage transformer and bridge rectifier to the building's AC power circuit. Checking the integrity of these connectors allows you to eliminate these components as a possible cause for EPS power problems.

1. **REMOVE POWER (AC and Battery) FROM THE PANEL.**

2. Remove the two Torx screws that secure the EPS to the chassis.

3. Disconnect the EPS harness from connectors P1 and P2 on the EPS module.

4. Disconnect and visually inspect the AC power connector on the side of the EPS. This connector mounts to the bottom of the panel chassis, and connects the incoming AC Power wiring to the input wiring of the EPS line voltage transformer. Disconnect and check the connectors and wires. Gently pull on the wires to make sure that they are firmly attached to the connector. Refer to Figure B-6 for the location of the bulkhead connector.

5. Lift the EPS assembly from the chassis, and visually inspect the four connectors attached to the bridge rectifier. See Figure B-5 for their location. Remove each connector one at a time and check the crimped connection between the connector and the wire. Gently pull on the wires to make sure that they are firmly attached to the connector.

6. Reattach all connectors and reapply AC power. Check the voltage at RED1 and BLK1. If there still is no voltage, replace the EPS's line voltage transformer and bridge rectifier. Refer to "Replacing the EPS Line Voltage Transformer and Bridge Rectifier" later in this chapter for information on doing this.

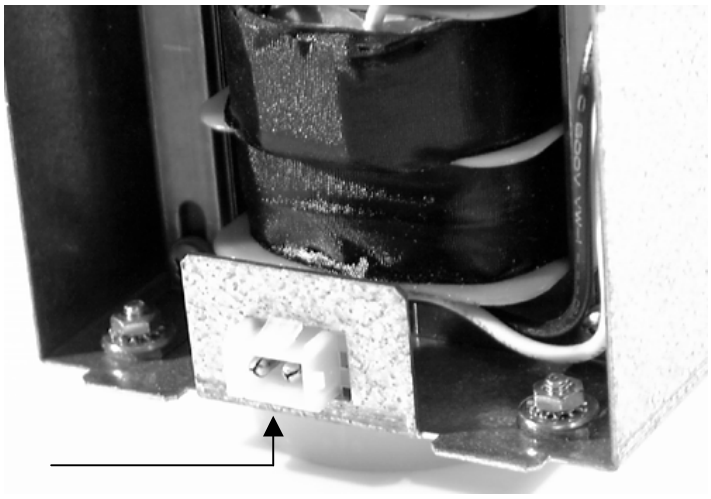

Figure B-6. Visually Inspect the Condition of Terminals

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Replacing the EPS Line Voltage Transformer and Bridge Rectifier

If there is no voltage at RED1 and BLK1 and a visual inspection of the connectors does not reveal any obvious problems, you should replace the line voltage transformer and the bridge rectifier on the EPS, using the following instructions.

1. **REMOVE AC POWER FROM THE PANEL.**

2. Remove the two Torx screws that secure the EPS assembly to the chassis.

3. Disconnect the External Power Supply harness from connectors P1 and P12 on the 4010 PC board.

4. Lift the EPS assembly from the chassis, and disconnect the four connectors attached to the bridge rectifier.

6. Unbolt the bridge rectifier and transformer from the 4010 chassis and replace.

7. Reconnect wires to the bridge rectifier, as follows:

   - The bridge rectifier contains two terminals marked AC. Connect the Brown and Blue wires to these terminals. It is not important which wire goes to which AC terminal.
   - Connect the RED1 wire to the terminal labeled +
   - Connect the BLK1 wire to the terminal labeled -
   - The orange and yellow wires are not connected and should be neatly tucked within the enclosure.

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Appendix C
Diagnostic Utilities, Basic Service Procedures, and Known Solutions

Introduction

Running the 4010's built-in diagnostic utilities is the easiest way to ensure proper communication between the FACP and its various devices. To use the Diagnostics, you must be logged in at a **Level 4**.

This appendix provides a summary of the built-in diagnostic utilities provided with the 4010 FACP.

In this Appendix

This appendix discusses the following topics:

Topic	See Page #
N2 Comm Diagnostics	C-2
IDNet Diagnostics	C-3
IDNet Earth Fault Search Diagnostics	C-4
Network Diagnostics	C-5
WalkTest	C-6
TrueTest	C-7
Basic Service Procedures	C-9
Known Solutions	C-11

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N2 Comm Diagnostics

Procedure

Use the N2 Comms Diagnostics to check for noisy N2 comm lines and other N2 comm errors

1. Press <MENU>.
2. Press <NEXT> or <PREVIOUS> until [Diagnostics] is displayed and then press <ENTER>.
3. Press <NEXT> or <PREVIOUS> until [N2 COMM] is displayed and then press <ENTER>.
4. Press Press <NEXT> or <PREVIOUS> until [ON] is displayed and then press <ENTER>.

The screen in Figure C-1 shows a typical N2 Communication Diagnostic screen. This screen informs you of the amount of messages sent, the amount of message retries and the amount of card failures. Note that these tallies are only kept while diagnostics are active.

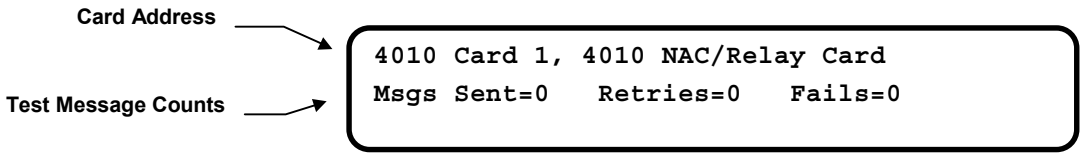

Figure C-1. N2 Communication Diagnostic Screen

Pressing <NEXT> or <PREVIOUS> scrolls through the available cards that are communicating on the N2 lines and displays that card's N2 diagnostic information.

Pressing <ENTER> (while a particular card's information is displayed) prompts you to press <ENTER> again to clear the message counts for that card.

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IDNet Diagnostics

Procedure

1. Press <MENU>.
2. Press <NEXT> or <PREVIOUS> until [Diagnostics] is displayed and then press <ENTER>.
3. Press <NEXT> or <PREVIOUS> to select [IDNET DIAGNOSTICS] and then press <ENTER>.
4. Press <NEXT> or <PREVIOUS> to select either [DUPLICATE DEVICES] or [WEAK ANSWER DEVICES] and press [Enter].

Duplicate Devices

To detect devices set to the same address you can activate the IDNet Diagnostics - Duplicate Device option. Once activated, there is a trouble in the panel indicating that you have activated the option. The two devices set to the same address then come in as a duplicate device trouble for that address. Acknowledge the trouble and view the point information to determine the address that the devices are set to and correct the problem.

Duplicate devices are also detected during a Quick CFIG. If a duplicate device is detected during a Quick CFIG, the Quick CFIG terminates and the following occurs:

- If the duplicate address is a smoke detector, the panel turns ON the LEDs of the devices.
- If the device is not a detector with an LED, program the device types and point types of all points, download the job to the panel, and use the NO Answer Trouble messages to determine which devices have duplicate addresses.

Weak Answer Devices

When receiving a Weak Answer Trouble you can determine which device is causing the trouble by activating the IDNet Diagnostics - Weak Answer option. When activated there is a trouble in the panel informing you that the option is active. Acknowledge the trouble and wait. Any device that is weak will then report NO ANSWER when the Weak Answer Diagnostic is run.

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IDNet Earth Fault Search Diagnostics

Procedure

Use the IDNet Earth Fault Search Diagnostics to locate an "earth" between the panel and the first IDNet isolator device or to another isolator device. Note that the 4010 FACP does not function as a fire panel for the duration of an Earth Fault search.

1. Press <MENU>.
2. Press <NEXT> or <PREVIOUS> until [Diagnostics] is displayed and then press <ENTER>.
3. Press <NEXT> or <PREVIOUS> to select [IDNET EARTH FAULT SEARCH] and then press <ENTER>.
4. Press <NEXT> or <PREVIOUS> to select [ON] and then press <ENTER>.

If an "earth" cannot be isolated or there are no isolators configured on the system, the 4010 returns a "**Unable to Isolate Earth Fault**" message.

If the "earth" is isolated between the first isolator and the FACP, the 4010 returns a "**Earth Fault Between Panel and 1st Device**" message.

If the "earth" is isolated to any other device, the 4010 returns a "**Earth Fault Isolated to Device M1-X**" where X is the isolator address.

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Network Diagnostics

Network Diagnostics

Network diagnostics allow you to check the node number of the 4010, the network topology, and network attendance.

Figure C-2 shows a typical Network Topology screen. Topology information shows how the network is physically wired and whether there are any breaks in the network loop.

M = Monitor Node
L = LEFT End Node
R = RIGHT End Node
(_) = This Node
▮ = Missing Node

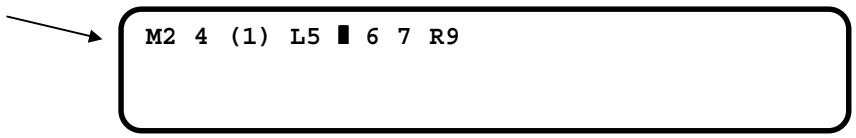

Figure C-2. Network Topology Screen

Attendance information shows if the network nodes are configured. Each position on the 4010's LCD represents a node's address for a maximum of 80 nodes (only 80 nodes can be displayed because there are only 80 positions on the 2 by 40 character LCD). Each node can only be represented by one character. Figure C-3 is NOT a typical Attendance screen, it is shown for reference only.

1 = Node Number 1
M = Monitor Node (Node Number 2)
. = No node configured at this address
4 = Node Number 4
L = Node Number 5 (fifth position on the screen) and it is the Left End Node.
▮ = Missing Node
7 = Node Number 7
R = Node Number 9 (ninth position on the screen and it is the Right End Node.
2 = Node Number 22 (twenty-second position on the screen)
3 = Node Number 43 (forty-third position on the screen)
9 = Node Number 79 (seventy-ninth position on the screen)

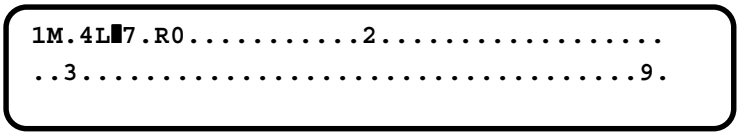

Figure C-3. Network Attendance Screen

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Walk Test

Overview

Walk Test allows one person to test the functionality of the 4010. Once the panel is placed into Walk Test mode, any device can be tested in any order. For each device, you should simulate both an alarm and trouble. If an audible or visible indication is used, wait for the indication before moving on to the next device. Walk Test options are viewed by selecting the WalkTest entry at the main menu. The Walk Test screens allow you to customize the Walk Test operation. The signals (if enabled) annunciate device coding for Walk Test. Earth Faults on both the front panel display/tone-alert and by activating audible and visible notification circuits for 4 seconds. Suppression release outputs are **NOT** activated by Walk Test.

Walk Test automatically aborts after eight hours and restores the panel to normal operation.

Using Walk Test

To activate Walk Test, follow Steps 1 through 6.

1. Press <MENU>.
2. From the High-Level Status screen, press <MENU>.
3. Press <NEXT> or <PREVIOUS> until [WalkTest] is displayed and then press <ENTER>.
4. Press < > or < > to move the focus brackets to the desired option.
5. Press <NEXT> or <PREVIOUS> to scroll through the following choices:
   - On/Off — *Walk Test mode.*
   - Log/No Log — *allows events to be recorded to the Historical Logs.*
   - Signal/Silent — *activate/deactivate Signals*.
6. Press <ENTER> to activate Walk Test.

Figure C-4 shows an example of the Walk Test screen with the default values.

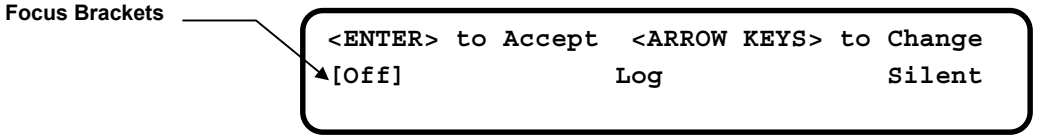

Figure C-4. Walk Test Screen

Important Notes

- Smoke detector LEDs do not activate in Walk Test when the 4010 BIN file is at Version 1.
- A head missing trouble is not reported during Walk Test.
- Walk Test does not sound signals that are controlled via Custom Control programming.

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TrueTest

Overview

The TrueTest feature provides a simple method of testing the application specific software in the FACP without the need to manually activate the initiating device circuits. In other words, TrueTest provides an easy method of testing the Input/Output programming to verify that the programming is written as the customer specified.

Once the panel is in TrueTest mode, you can modify a point's status by selecting the desired point at the front panel and pressing <NEXT> or <PREVIOUS> until the TrueTest screen is displayed. The point's custom label and device address are displayed along with an option select box allowing you to select the desired TrueTest physical state.

The choices for the TrueTest state depend on the currently selected point's attributes. For monitor hardware device type points, the options are NORMAL, ABNORMAL, OPEN, and SHORT. For TrueAlarm sensors, the sensitivity threshold possibilities available for the selected device are presented. Press <NEXT> or <PREVIOUS> to scroll through the possible choices for that point type.

Once you have selected the desired state, pressing <ENTER> forces the state change as a TrueTest simulated event. Pressing <EXIT/CLR> exits the TrueTest menu without making any changes.

When a TrueTest simulated event occurs, the system responds as if that point had actually entered the specified state up to the point of activating control outputs if NoCTRL is selected. If CTRL is selected, selected outputs activate. Any control point activation, DACT reporting, printing, and logging is selected in the TrueTest menu (refer to Table C-1 for options). Any LEDs programmed to track any point also operate (there is no way to disable this).

- **Table C-1. TrueTest Menu Options**

TrueTest Option	Description
On/Off	Activates or deactivates TrueTest.
Log/NoLog	Determines whether the TrueTest events are sent to the logs.
Print/NoPrint	Determines whether the TrueTest events are sent to a printer.
DACT/NoDACT	Determines whether any events occurring in TrueTest are reported to the DACT.
NoCTRL/CTRL	By default no control circuits of any kind are activated during the test. If desired, all control points may be activated during the test by selecting CTRL. this category includes all control points (audibles, visibles, and any other control points).

Continued on next page

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Using TrueTest

Use Steps 1 through 5 and Figures C-5 to activate TrueTest.

1. Press <MENU>.
2. Press <NEXT> or <PREVIOUS> until [TrueTest] is displayed and then press <ENTER>.
3. Press < > or < > to move the focus brackets to the desired option.
4. Press <NEXT> or <PREVIOUS> to enable the options shown in the figure below.
5. Once all options are set, press <ENTER> to activate TrueTest.

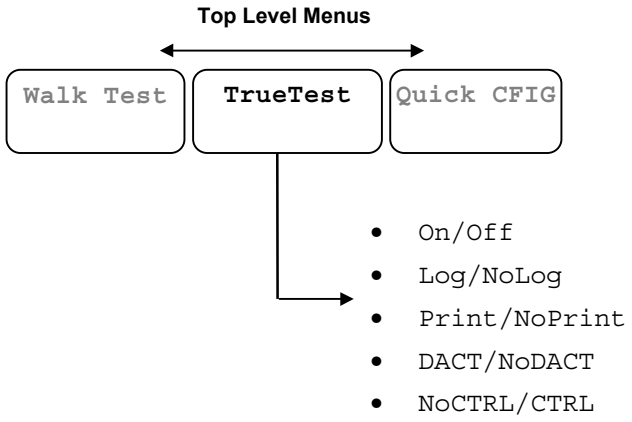

Figure C-5. TrueTest Options

Figure C-6 shows an example of the TrueTest screen with the default values.

Figure C-6. TrueTest Screen

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Restoring the 4010's Default Programming

The following procedure returns the 4010 CFIG (job) loaded on the panel to a factory default state. This includes all system options, custom labels, custom control, etc. This procedure only works for a Rev. 2.01 or higher system.

To do this, follow these steps:

1. Press the Warm Start button.
2. Press and hold the Left and Right arrow keys.

Determining the BIN File Software Revision

The 4010's software revision is actually the revision level of the BIN file downloaded to the panel. Use the following procedure to determine this information:

1. Press <MENU>.
2. Press <NEXT> or <PREVIOUS> to scroll through the options until [SOFTWARE REVISION] is displayed and then press <ENTER>.
3. Press <ENTER>. Information *similar* to the following appears. The number following **Sys Rev.** is the revision level of the panel's BIN file.

```
Sys Rev 2.00.06                  4010 System
JOB REV: 1    12:00:00 am    Wed 27-Aug-97
```

Figure C-7. CFIG Properties

Disabling the Piezo on a Remote LCD Annunciator

Disable the piezo on a 4606-9101 Remote LCD Annunciator by turning ON digital pseudo point P48 (LCD Annunciator Sounder Disable). To do this from the front panel, follow these steps.

1. Press <MENU>.
2. Press <NEXT> or <PREVIOUS> until [Control/View Points] is displayed and then press <ENTER>.
3. Press <NEXT> or <PREVIOUS> to scroll through the point types until the [Digital Pseudo Points] appears and press <ENTER>.
4. Press <NEXT> or <PREVIOUS> to scroll through the points until [P48] appears and press <ENTER>.
5. Press <NEXT> or <PREVIOUS> to toggle the state of the point.

Clearing an Event Overflow Trouble

Anytime the panel receives in excess of 127 events per second, the event queue overflows and the panel indicates this by generating an Event Queue Overflow Trouble. This trouble can be cleared in one of two ways:

- Restart the panel.
- Manually turn OFF Digital Pseudo Point P47.

Continued on next page

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Clearing an Event Overflow Trouble *(continued)*

Follow these steps to turn off P47 from the front panel.

1. Press <MENU>.
2. Press <NEXT> or <PREVIOUS> until [Control/View Points] is displayed and then press <ENTER>.
3. Press <NEXT> or <PREVIOUS> to scroll through the point types until the [Digital Pseudo Points] appears and press <ENTER>.
4. Press <NEXT> or <PREVIOUS> to scroll through the points until P48 appears and press <ENTER>.
5. Press <NEXT> or <PREVIOUS> to toggle the state of the point.

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Known Solutions

Supervisory Point Type and Output Devices

The supervisory point type, when used with system outputs such relays, does not work in Revision 1 of the 4010. (Assigning a Supervisory point type to an output should automatically turn the output ON when a Supervisory event occurs.)

Two solutions exist for this problem:

- Replace Version 1.x software with Version 2.x BIN file and programmer software. Version 2.x of the 4010 resolves this problem. Refer to Appendix A for compatibility guidelines.
- If you must use Version 1.x software, use custom control to program the operation of the output. Monitor the state of analog pseudo point A2, which is the analog pseudo that counts supervisory conditions in the system.

  Input

  ON state of A2

  Output

  Track ON Relay

  In this case, the relay turns off when the supervisory condition clears.

Incorrect Operation of IDNet Device 124 and 24

The 4010 does not properly control IDNet devices at addresses 124 and 24. This includes TrueAlarm device LEDs, relays, sounder bases, and relay IAMs. Incoming status (i.e., Alarm and Trouble) report properly, but the device output does not activate.

Replace Version 1.x software with Version 2.x BIN file and programmer software. Version 2.x of the 4010 resolves this problem. Refer to Appendix A for compatibility guidelines.

Remote LED Connected to a Duct Sensor

Remote LEDs connected to a duct sensor do not illuminate when the duct sensor goes into alarm. This is a Version 1.x problem that has been fixed by Version 2.x.

SDACT Conversion Errors

When used in conjunction with the 4010, the SDACT programmer must be at Revision 1.04 or higher.

Problems Downloading to the SDACT

If you are unable to download to the SDACT, move the SDACT's switch to the OFF position and then back to the ON position while the programmer is attempting to download the file.

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24-Point I/O Incorrect Relay / LED Operation

In cases where the relay or LED connected to a 24 point I/O output does not pick or light, check the field wiring to make sure voltage is wired to TB2.

System Reset Problems -- IDNet Class A Trouble

A 4010, containing a Revision 1.x BIN file, does not reset when the following conditions are true:

- A Class A IDNet trouble exists
- A device is in alarm

This problem has been corrected by Version 2.x of the 4010 software.

System Reset Problems -- Lengthening Reset Timer for Networked Systems

The 4010 reset duration -- the amount of time required by the 4010 to perform a reset -- is self-adjusting based on the number of IDNet devices attached to the system. If the 4010 has a large number of devices (approximately 200), the 4010's reset duration may exceed the reset timer of a networked panel, causing reset problems.

If this occurs, lengthen the reset timer on **every** networked panel that annunciates 4010 alarms.

IN:
THE ON STATE OF
A34 TIMER "SYSTEM STARTUP PULSE TIMER
OUT:
SET TO VALUE 40 (SECS) THE ANALOGS
A15 ANALOG "SYSTEM RESET WINDOW TIMER SETPOINT"
END:

Custom Control Problems – Invalid Opcode for IPHOTO or RPHOTO

Points with a valid device type of IPHOTO or RPHOTO may receive an "Invalid Device Type for this Opcode" message, when used within a Custom Control output statement.

If this occurs, either include the points in a list and add them to the output statement, or upgrade the programmer to Rev. 2.

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Appendix D
Troubleshooting Fiber Optic Links

Introduction

This appendix provides basic troubleshooting procedures related to fiber optic transmitters and receivers.

In this Appendix

This appendix discusses the following topics:

Topic	See Page #
Class A LED Displays	D-3
Class B LED Displays	D-5

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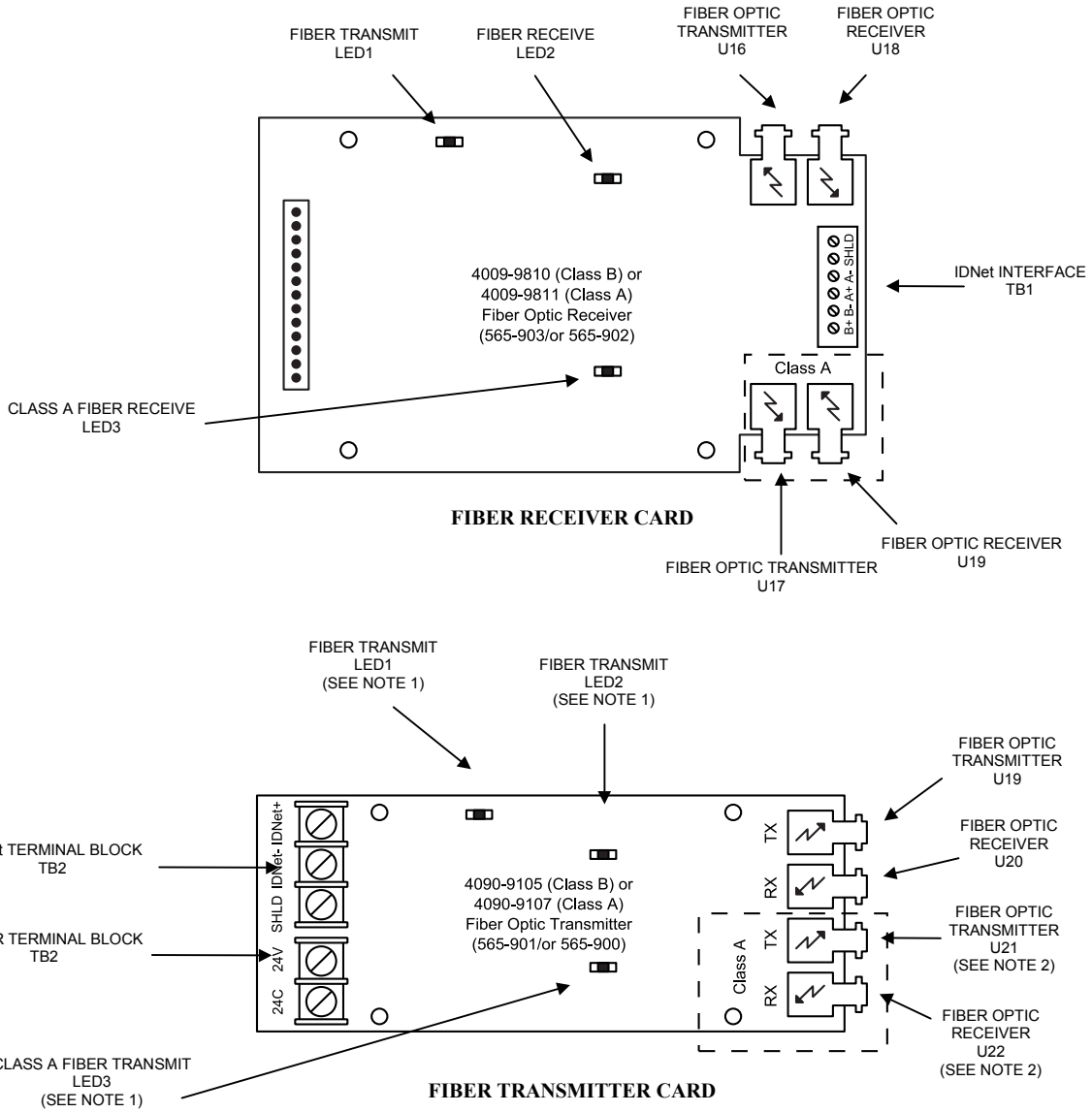
Overview

Introduction

Figure D-1 shows the locations of the connectors and LEDs for the 4009 IDNet Fiber Optic cards, which can be used to link the 4010 to a remote 4009 IDNet NAC extender.



Notes:

1. LEDs 1-3 indicate the following conditions:
   - Green LED1 flashes when data is being transmitted out fiber.
   - Red LED2 flashes when data is being received from fiber.
   - Red LED3 flashes when data is being received on the Class A fiber receiver.
2. Shown equipped with optional Class A Receiver/Transmitter Card components.

Figure D-1. 4009 IDNet Fiber Receiver/IDNet Transmitter Option Cards

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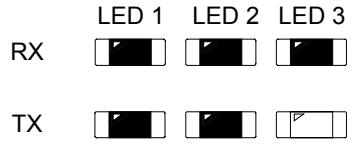
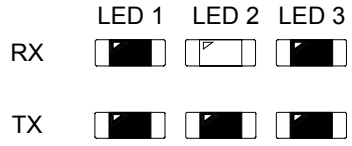
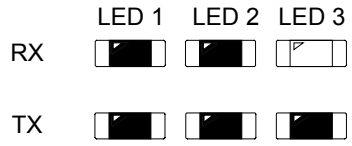
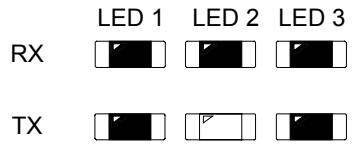
Class A LED Displays

Table D-1. Class A Fiber LED Displays

LED Pattern	Possible Cause/Troubleshooting
	Indicates a problem with the Class A connection between U17 on the fiber optic receiver card and U22 on the fiber optic transmitter card. Check the following: • Check the U17 and U22 connectors. Make sure that they are securely attached to the receiver or transmitter card. A problem with either of these connectors causes this LED pattern. • Check the integrity of the fiber connection running between U17 and U22. A break or defect in the fiber running between these connectors causes this LED pattern.
	Indicates a problem with the Class A connection between U18 on the fiber optic receiver card and U19 on the fiber optic transmitter card. Check the following: • Check the U18 and U19 connectors. Make sure that they are securely attached to the receiver or transmitter card. A problem with either of these connectors causes this LED pattern. • Check the integrity of the fiber connection running between U18 and U19. A break or defect in the fiber running between these connectors causes this LED pattern.
	Indicates a problem with the Class A connection between U19 on the fiber optic receiver card and U21 on the fiber optic transmitter card. Check the following: • Check the U19 (the one on the fiber optic receiver card) and U21 connectors. Make sure that they are securely attached to the receiver or transmitter card. A problem with either of these connectors causes this LED pattern. • Check the integrity of the fiber connection running between U19 and U21. A break or defect in the fiber running between these connectors causes this LED pattern.
	Indicates a problem with the Class A connection between U16 on the fiber optic receiver card and U20 on the fiber optic transmitter card. Check the following: • Check the U16 and U20 connectors. Make sure that they are securely attached to the receiver or transmitter card. A problem with either of these connectors causes this LED pattern. • Check the integrity of the fiber connection running between U16 and U20. A break or defect in the fiber running between these connectors causes this LED pattern.

Continued on next page

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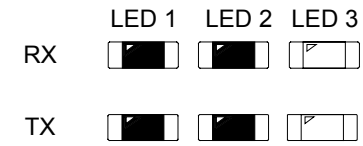
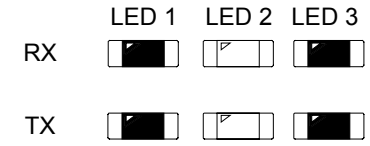
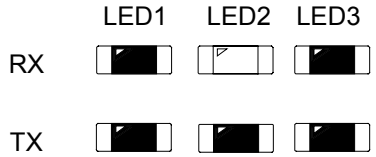
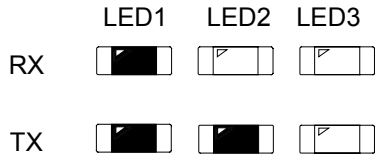
Table D-1. Class A Fiber LED Displays (*continued*)

LED Pattern	Possible Cause/Troubleshooting
	Indicates a problem with connectors U17 and U19 on the fiber optic receiver card. Check the following: • Check to see if U17 and U19 are crossed. U17 must connect to U22 on the fiber optic transmitter card, and U19 (on the receiver card) must connect to U21 on the transmitter card. • This LED pattern also occurs if both U17 and U19 on the receiver card are unconnected.
	Indicates a problem with connectors U16 and U18 on the fiber optic receiver card. Check the following: • Check to see if U16 and U18 are crossed. U16 must connect to U20 on the fiber optic transmitter card, and U18 must connect to U19 on the transmitter card. • This LED pattern also occurs if both U16 and U18 on the receiver card are unconnected.
	Indicates a problem with connectors U19 and U18 on the fiber optic receiver card. Check the following: • Check to see if U19 and U18 are crossed. U19 on the receiver card must connect to U21 on the fiber optic transmitter card, and U18 must connect to U19 on the transmitter card. • This LED pattern also occurs if both U19 and U18 on the receiver card are unconnected.
	Indicates a problem with connectors U17 and U18 on the fiber optic receiver card. Check the following: • Check to see if U17 and U18 are crossed. U17 on the receiver card must connect to U22 on the fiber optic transmitter card, and U18 must connect to U19 on the transmitter card. • This LED pattern also occurs if both U17 and U18 on the receiver card are unconnected.

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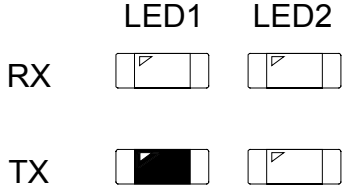
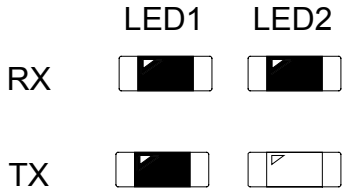
Class B LED Displays

Introduction

The following table identifies the two possible LED displays for a Class B fiber optic circuit.

LED3, which is the Class A Fiber LED does not have significance for a Class B circuit.

Table D-2. Class B LED Displays

LED Pattern	Possible Cause/Troubleshooting
	Indicates one of the following: • There is a problem with the fiber running between U18 on the fiber receiver card and U19 on the fiber optic transmitter card. • There is a problem with both fibers (i.e., both fibers are damaged or cut). • The fiber cables were wired incorrectly (i.e., TX to TX and RX to RX). Make sure that U18 on the receiver connects to U19 on the transmitter. Likewise, make sure U16 on the receiver connects to U20 on the transmitter.
	Indicates a problem (damage, break, bad connectors) with the fiber running between connectors U16 on the receiver and U20 on the transmitter card.

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